1250 Watt Ku-Band Antenna Mount High Power Amplifier

The XTD-1250KHE is a compact, self-contained, antenna mountable power amplifier designed for low cost installation and long life. The XTD-1250KHE design eliminates the need for an amplifier shelter as well as a long waveguide run between the amplifier and antenna feed horn. RF filters, cooling, and monitoring & control (M&C) systems are all self-contained.

The XTD-1250KHE incorporates high efficiency, multi-stage collector 1250W peak power TWT. The output operational power is limited, however the linear power performance at 575W and below is equivalent to a 1250W tube. Depending upon user requirements, the amplifier can be configured for either single thread or redundant system operation.

The XTD-1250KHE may be configured for single thread, redundant, phase-combined, or linearized operation.

A remote external controller is available to operate the HPA from a user selected location. Mounting brackets can be supplied to mount the HPA to most popular antennas.

**FEATURES**

- 1250 watts peak power, 575 watts linear power with linearizer
- Rugged design operates to +60°C
- Optional L-band BUC
- No shelter required
- Identical outline makes an ideal upgrade from 750W systems
- Includes overdrive protection circuitry
## PERFORMANCE SPECIFICATION

### Parameters

<table>
<thead>
<tr>
<th>Parameters</th>
<th>XTD-1250KHE</th>
<th>XTD-1250KHE1</th>
</tr>
</thead>
<tbody>
<tr>
<td>FREQUENCY RANGE</td>
<td>13.75 to 14.5 GHz</td>
<td>12.75 to 14.5 GHz</td>
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</table>

### OUTPUT POWER

- **TWT Peak Power (typical)**: 61.0 dBm (1250 W)
- **HPA Flange Peak Power**: 60.3 dBm (1070 W)
- **Linear Rated Power, HPA Flange (w/Linearizer)**: 57.6 dBm (575 W)
- **CW Power Max @ Flange**: < 58.3 dBm (675 W)

### GAIN

- **Large Signal (minimum)**: 70 dB
- **Small Signal (minimum)**: 70 dB
- **Attenuator Range (continuous)**: 25 dB
- **Maximum SSG Variation Over**
  - Any Narrow Band: 1.0 dB per 80 MHz
  - Full Band: 2.5 dB per 500 MHz
  - Slope (maximum): ± 0.04 dB/MHz
  - Stability, 24 hr. (maximum): ± 0.25 dB
  - Stability, Temperature (maximum): ± 1.0 dB over temperature range at any frequency

### INTERMODULATION

- **with two equal carriers**: -25 dBc @ $P_{LIN}$

### HARMONIC OUTPUT (maximum)

- **-60 dBc**

### AM/PM CONVERSION (maximum)

- **2.0 deg/dB @ $P_{LIN}$**

### NOISE POWER (maximum)

- **Transmit Band**: -70 dBW/4 kHz
- **Receive Band**: -150 dBW/4 kHz
  - 10.95 to 12.75 GHz
  - 10.95 to 11.75 GHz

### GROUP DELAY (maximum)

- **Bandwidth**
  - Any 80 MHz
- **Linear**: 0.01 nS/MHz
- **Parabolic**: 0.001 nS/MHz²
- **Ripple**: 0.5 nS/Pk-Pk

### RESIDUAL AM NOISE (maximum)

- **-50 dBc to 10 kHz**
- **-20 (1.5 + $\log f$) dBc 10 to 500 kHz**
- **-85 dBc above 500 kHz**

### PHASE NOISE (maximum)

- **12 dB below IESS phase noise profile**
  - AC fundamental: -50 dBc
  - Sum of all spurs: -45 dBc

### VSWR

- **Input (maximum)**: 1.3:1
- **Output (maximum)**: 1.3:1
TECHNOLOGY

BLOCK DIAGRAM

OUTLINE DRAWING

DIMENSIONS

<table>
<thead>
<tr>
<th></th>
<th>Inches</th>
<th>Centimeters</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>21.5</td>
<td>54.61</td>
</tr>
<tr>
<td>H</td>
<td>11.0</td>
<td>27.94</td>
</tr>
<tr>
<td>W</td>
<td>12.75</td>
<td>32.39</td>
</tr>
</tbody>
</table>

Weight: 81 lbs, (36.8 kg)

RF OUTPUT

<table>
<thead>
<tr>
<th>Frequency Band</th>
<th>Wave Guide Flange</th>
</tr>
</thead>
<tbody>
<tr>
<td>KU</td>
<td>WR-75, Cover</td>
</tr>
</tbody>
</table>
PRIME POWER
180 to 260 VAC
47 to 63 Hz, Single Phase
2300 VA Typical
0.95 Minimum Prime Power Factor

ENVIRONMENT
NONOPERATING TEMPERATURE RANGE -50°C to +70°C
OPERATING TEMPERATURE RANGE -40°C to +60°C (2°C/1000 Feet Derating)
HUMIDITY Up to 100% Condensing
ALTITUDE 10,000 Feet MSL Max.
SHOCK AND VIBRATION Normal Transportation
COOLING Forced Air

INTERFACE
Type Function
LOCAL CONTROL Prime Power ON/OFF Local/Remote
Power Supply ON/OFF HV ON/OFF
LOCAL STATUS Tri-Color LED:
Fault: Red Standby: Continuous Amber
HV ON: Green FTD: Flashing Amber
REMOTE CONTROL HV ON/OFF Constant Power
Min/Max Power Alarm/Fault Gain
Reflected Power Alarm/Fault Fault Reset
Heater Standby ON/OFF Units (Watts, dBm, dBW)
REMOTE STATUS Power Out Reflected Power
Helix Current Helix Voltage
Heater Hours Beam Hours
Attenuator Settings Units Selection
TWT Temperature Faults:
High VSWR
High Voltage
Helix Current
TWT Temperature
Arc Detection
FORM C DRY CONTACT CLOSURE Summary Fault
COMPUTER SERIAL PORT Hardware Interface:
2 ports: RS-232 & RS-422/485
Xicom Command Set: ASCII Commands
RF MONITOR PORT -43 dB Nominal

OPTIONS
- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Block Upconverter
- Ethernet Interface
- Optional Frequency Range 12.75 to 14.5 GHz coverage

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Note: Technical specifications are subject to change without notice. Please contact Xicom Technology before using this information for system design.